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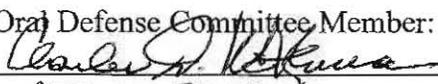
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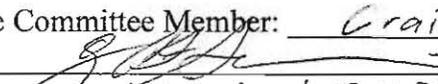
Duped by the "Frailty Myth:"¹
USMC Gender Based Physical Fitness Standards

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¹Colette Dowling, *The Frailty Myth: Redefining the Physical Potential of Women and Girls* (New York: Random House, 2000), 3.

Executive Summary

Title: Duped by the “Frailty Myth:” USMC Gender Based Physical Fitness Standards

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Thesis: Female frailty is a myth; women Marines have the strength and ability to perform pull-ups and should be required to do so on the PFT in order to evaluate more accurately female upper-body strength, properly condition women for the likelihood of combat, and mitigate the negative impact that differing standards have on unit cohesion.

Discussion: American women have been dying in combat on the non-linear battlefield for over twenty years. Despite this fact, the Corps is not preparing female Marines adequately for the physical rigors of combat. The Marine Corps’ manual for physical fitness states, “Every Marine must be physically fit, regardless of age, grade, or duty assignment.” Further, an essential aspect of combat readiness is physical conditioning that includes strength training, defined as “the ability of the muscular system to move the body through resistance... and the ability of Marines to effectively handle their own body weight.” Upper-body strength training for females, however, is largely ignored. The neglect of upper-body development for women is demonstrated, and perpetuated, by the absence of an accurate metric to measure upper-body strength for female Marines on the physical fitness test (PFT). To date, the PFT requires female Marines to perform a flexed-arm hang (FAH), despite a TECOM report on 30 August 2001 that the FAH “had no correlation to combat strength/skill.” Despite this ten -year-old report and compelling evidence recently published by TECOM that pull-ups are a more appropriate metric than the FAH and that female Marines are capable of performing pull-ups, the study did not effect any change to the PFT standard. Why the reluctance to update USMC PFT standards for women? The irrational insistence on maintaining outdated standards for women Marines supports the concept that “learned female weakness” has been systematically entrenched in American society, and by extension, in the United States Marine Corps.

Conclusion: According to the USMC’s manual for physical fitness, “Marines who are not physically fit can be a detriment to the readiness and combat efficiency of their unit.” Due to a lack of strength conditioning, female Marines are far from their physical potential and risk being a detriment to their unit. The USMC will be a better fighting organization if the PFT standards are updated to incorporate a suitable metric, such as pull-ups, for measuring and developing upper-body strength in female Marines. The USMC can dispel the frailty myth by eliminating gender-based performance requirements on the PFT.

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Preface

I have three secrets. The first is that I am ordinary, but because many people correlate my gender and 4 foot 10 inch stature to an inability to perform various physical feats, when I succeed, people often think I am better than I truly am; it is not hard to surpass people's low expectations. Thus, when I stay in a hike while carrying my own gear, negotiate the Marine Corp's obstacle course without assistance, or perform several sets of pull-ups, people are consistently awestruck, even though I am performing ordinary tasks that are *expected* of other Marines. I am also automatically bestowed with various intellectual qualities and leadership traits; some Marines, not having ever met me but having heard rumors about my "unique" capabilities, have deemed me an "outstanding" officer just for my pull-up prowess alone.

The second secret is that my ability to perform twenty pull-ups is not unique or distinct- any woman who can do one pull-up can train to do twenty. In the following pages, I will demonstrate that low standards and expectations create a false perception of a Marine's potential and more often *inhibit* vice encourage his or her performance, thereby creating a negative command climate and preventing most women from trying. Students train for what is on the test! In particular, low expectations for female Marines have caused the Corp's female physical fitness standards to stagnate. Like slaves who were made to rely on their masters then were criticized for being dependent, female Marines are held to a lower physical fitness standard than their male counterparts then are criticized for being less fit. Subsequently, (some) women's inability to perform pull-ups or keep up on runs and hikes, for example, is used to justify the Corp's lower physical fitness test (PFT) standards. Those that do keep up are labeled anomalies.

The tendency to dismiss women who shatter physical stereotypes as "anomalies" is pervasive, yet others will go to great lengths to maintain that even anomalies do not exist.

Several years ago, following a ten-mile hike, I learned that Marines from another platoon assumed I had passed my gear off during the hike when they saw me at the front of my platoon at the hike's conclusion. The hike was difficult, yet I completed it with all my gear without "falling out". Never the less, even though the Marines who doubted my ability to complete the hike of my own accord did not *see* members from my platoon take my gear, they automatically assumed it was so because I could not have *possibly* stayed in formation during the hike otherwise.

Frustrated with some people's refusal to accept the possibility female strength, I chose to research this topic in pursuit of my Master of Military Studies. In doing so, I confirmed my suspicion that the Corp's PFT standards were the origin of the belief in female weakness and confirmed my initial observations regarding women's real versus perceived capabilities. Thus, my intent in writing on the topic was to educate the USMC about women's *actual* physical potential in order to persuade the Corps that women can and should perform pull-ups on the PFT.

My intent for writing my paper brings me to my third secret. I have the formula for pull-up excellence: Specificity + Frequent Practice = Success. The theory is called "synaptic facilitation", which means by doing frequent, non-exhaustive sets of a specific exercise, your muscles gradually get more efficient at the movement. By becoming more efficient, it becomes easier for your muscles to repeat the movement. In other words, to increase your number of pull-ups, you need to practice pull-ups. In my paper, I will demonstrate why this process works for all Marines, regardless of gender. For work-out specific details, see Appendix A.

Acknowledgements

I would like to thank John for daring me to improve and Adam for teaching me the best techniques for doing so. In addition to teaching me Pavel's Ladder (Appendix A), I am also indebted to Adam for teaching me to see my physical potential rather than limitations. I am also grateful that Colette Dowling wrote *The Frailty Myth* and that I discovered her book in time to include her research in my paper. Additionally, I am fortunate Brian McGuire was willing to take time out of his day to educate me on the evolution of the Corp's PFT standards. Without his assistance, my research would have been lopsided and incomplete; merely circumstantial. I would also like to acknowledge Dean McKenna for his patience and attention to detail while reviewing my drafts. Additionally, his enthusiasm for my topic and encouragement directly contributed to my ability to wade through the tremendous amount of data I had uncovered in an attempt to produce a comprehensive and compelling thesis worthy of his praise. Finally, I would like to thank Rob for his loyalty and unwavering support, which allowed me to completely dedicate myself to this project.

Introduction

The United States Marine Corps (USMC) is “institutionally constipated”¹ with outdated, gender-based physical fitness standards. In order to maintain its edge as a fighting organization, Marine Corps Order P6100.12 from the USMC’s manual for physical fitness states, “Every Marine must be physically fit, regardless of age, grade, or duty assignment... Marines who are not physically fit can be a detriment to the readiness and combat efficiency of their unit.”² The manual goes on to state that an essential aspect of physical conditioning includes strength training, defined as, “... the ability of the muscular system to move the body through resistance... and the ability of Marines to effectively handle their own body weight.”³ The Corps, however, is not physically preparing every Marine adequately for the rigors of combat in an optimal manner. Despite the strength training requirement for all Marines, upper-body development for females is largely ignored, which is demonstrated and perpetuated by the lack of a pull-up requirement for women Marines on the physical fitness test (PFT). To date, the PFT requires female Marines to perform a flexed-arm hang (FAH), despite a Training and Education Command (TECOM) report on 30 August 2001 that the FAH “had no correlation to combat strength/skill.”⁴ In June of 2011, TECOM followed up its 2001 report with a decision paper that concluded pull-ups were a more appropriate metric of measuring strength than the FAH and that women were capable of performing pull-ups.⁵ Never-the-less, the study did not affect any change to the PFT standard.⁶

Why the insistence on “measuring women’s performance with an antiquated ruler?”⁷ Women have taken part in every major war in the nation’s history and female service members have been dying at the hands of the enemy on the non-linear battlefield since WWII.⁸ Moreover, the USMC determined the FAH to be irrelevant over then years ago.⁹ The Corps’ reluctance to update PFT standards to include a more appropriate strength metric for women Marines suggests

that it has been duped by an entrenched misconception that women are genetically incapable of developing strength, so much so that key decision makers in the USMC have failed to act rationally. Simply put, female frailty is a myth; women Marines have the strength and ability to perform pull-ups and should be required to do so on the PFT in order to evaluate more accurately female upper-body strength, properly condition women for the likelihood of combat, and mitigate the negative impact that differing standards have on unit cohesion.

Background: Learning Frailty

“A hundred years ago, [American] women were pushed backward in a very particular way.”¹⁰ Just as they were beginning to demand the right to an education and more political and economic power, they were “stripped of the power of their bodies.” Nineteenth century women were required, “with all the persuasion of a moral movement,” to abandon strength and cultivate frailty on scientific grounds. They were given to believe weakness was their natural and irreversible condition, even though since Colonial times American women had proven their physical worth by effectively performing “non-traditional” duties when their countrymen called upon them to serve.¹¹ As an example, in the 1600s women performed back-breaking labor to help settle new territory. Since in Colonial America there was more work to be done than hands to provide it, idleness was not tolerated. Consequently, society needed and encouraged physical strength in women. As such, women rigorously toiled, inside and outside the home, often participating in traditional male occupations such as farming and running businesses. In 1775, women once again served their country by answering the call to assist proudly in the fight for America’s independence. Women became heads of households, assumed men’s jobs while they were away at war, and some even posed as male soldiers. In doing so, women experienced increased social, economic, political, and physical freedom in the performance of their ‘non-

traditional' duties. Proving their mental and physical worth not only to society, but to themselves, for the first time large numbers of women began to question the validity of the traditional standards of "delicacy." Realizing the democratic ideals of freedom and liberty they helped fight for in a country they helped establish did not apply to them, women began the early stages of emancipation.¹² Simultaneous with the rise of the women's movement in the middle of the 19th century, the Industrial Revolution crushed male farmers and small businessmen, and increasing numbers of women began to work outside the home. As a result, men were left pondering their identity and the very purpose of their existence.¹³ "Nineteenth century notions of [masculinity] were clearly in jeopardy."¹⁴ In response, 19th century American society, whose expectations determined virtually every aspect of women's lives and directed their actions, found it necessary to redefine and solidify women's proper place in the world. Community leaders determined it was a social necessity to confine women to the home, stating that it was woman's proper place to assume her noble role of mother. No other option was offered in this matter.

Since "strength was only encouraged in women when the economy needed it- during wars, while the men were away," it is no surprise its entire attitude shifted once American colonies became prosperous and society no longer needed women to help fight its wars. Women were good in a pinch, in other words, but physically no threat to the established hierarchy since when the men returned home life went back to "normal."¹⁵ Strength, courage, and the ability to take risks suddenly became unladylike; frailty became feminine and physical prowess once again belonged to men alone. Society explicitly characterized the proper woman as domestic, passive, and delicate.¹⁶ Women owed it to future generations to cultivate nothing but their fertility- not mind, and certainly not body, in order to fulfill their moral obligation to society. This became known as "the cult of true womanhood."¹⁷

Significantly, the cult of true womanhood, which was already pervasive, became *inescapable* when influential professionals “whose interests came together into a single compelling philosophy about woman's purpose on the planet” began to argue that biology supported their views.¹⁸ Physicians, obstetricians, gynecologists, psychologists, educators, and churchmen were chief proponents of the theory that “physical weakness” was woman’s natural condition. This theory, accepted as fact, was used to irrefutably support the cult of true womanhood; women were biologically and irreversibly weak and needed protecting, thus they were suitable only for child bearing.¹⁹ Particularly influential was the medical community- its credibility served to solidify the medical prescription of women’s limited sphere. The scientific nature of the health profession’s justification was especially significant since “...before the 1800s, religion and superstition supported the determination of women’s proper place.”²⁰ Hence, the “deviant” women who had begun to fight for equal rights came up against a science-based backlash from various groups of “prestigious and traditionally minded men” who attempted to preserve the status quo by exaggerating the real and perceived physical differences between the sexes.²¹ While there is no doubt that the concept served the purpose of thwarting the women’s movement and maintaining society’s notions of masculinity, it is important to note that health professionals *believed* their assessments were true. They “were convinced there was a scientific basis for their views.”²² In 1889, influential evolutionists claimed that animal studies showed males to have a highly active metabolism (catabolic) and females to have an inactive metabolism (anabolic) prone to sluggishness and passivity, which was proof that the “hierarchical distinction between the sexes ‘was based firmly upon... biology which could not be reversed’ .”²³

Specifically, health professionals believed that women could not be allowed to develop physically, even if they desired, because every ounce of energy they possessed was needed for maintaining their reproductive organs and processes.²⁴ Women's bodies were thought to operate on a "closed system," meaning the body had a finite amount of energy; diverting energy from one area of the body to another would cause other parts of the body to wither, such as the uterus.²⁵ As a result of this misunderstanding about women's bodies, society was certain that if women's physical pursuits outside of the home weren't curtailed, the human race was at risk. Essentially, the women's movement of the mid 1800s had become a public health crisis.²⁶ Moreover, women exercising even their minds was too risky. In 1873, Dr. Edward Clarke, prominent physician and Harvard professor, warned society of the potential danger of women attempting to gain an education, "...she may work her brain over mathematics, botany, chemistry, German, and the like... and [in doing] so... divert blood from the reproductive apparatus to the head."²⁷ Thus, attending school would cause women to lose "health, strength, blood and nerve" that could otherwise be used to support necessary reproductive processes. In 1902, even the *American Journal of Obstetrics and Diseases of Women and Children* stressed the importance of preserving pubescent girls' energy by not taxing their brains at school so their reproductive organs may thrive and flourish, "It lies in the fact that at the period of her existence when the girl needs... blood and nutrition for the perfecting of her [female organs]... she is placed under circumstances that diminish rather than enhance her blood-making powers."²⁸

Considering 19th century America's misunderstanding of women's bodies, it is not surprising that physical activity was forbidden since if *thinking* was too strenuous, then women exercising their bodies was almost certainly catastrophic. Physicians characterized women's hearts weak, their muscles delicate, and nervous system fine, making them prone to over-

stimulation if they were to exercise.²⁹ In addition to overstimulation, doctors considered young girls' tissues and organs peculiarly unstable and vulnerable to injury. Since according to one health educator, the genital organs tended to "decay as a result of exercise", it is no surprise that various doctors warned girls not to attend schools more than two stories high lest they "destroy themselves getting to the third floor." Additionally, a widely quoted medical textbook from 1879 advised girls to spend the years before and after puberty at complete rest. One male doctor, in particular, advised women to avoid exercise *all together*, lest they "dislodge" their uterus.³⁰

Victorians dutifully heeded the advice of their doctors and monitored women and girls closely since they deemed exercise beyond what was required to run a household as dangerous. Girls needed enough physical conditioning to handle the rigors of child birth and raising children, but not so much that they would be worn out. One doctor warned, "[A] long walk doesn't bring sufficient compensation for the fatigue it causes [women]."³¹ Thus, most health professionals believed women could get enough exercise to prepare for the onslaught of delivery by moving around the house, which was another reason to restrict women to a life indoors. "Sufficient strength could be gained in the kitchen, the washroom, and the gardens- 'nature's gymnasium' for adolescent girls."³²

Despite the warning against exercise, bicycling became popular with women in the late 1890s; however, the Victorian "health police" were quick to remind women of the health risks associated with such an activity. Bicycling could cause "incalculable harm", such as uterine displacement, damaged vulva, spinal deformity, and broken wrists and ankles from women's inability to support their weight on handlebars and pedals. "Bicycle face" was also dreaded. Described as "stern, strained, and grim," it was not the tender and loving visage men preferred.³³ Despite its unseemliness, bicycle face was significantly less concerning than "masculinization."

Thought to be caused by exercise and sport, one health educator proclaimed, “Too much activity of a masculine character causes the female body to become more like that of a man.”³⁴ Thus, exercise would not only harm women’s sexual organs, it would compromise their appeal to the opposite sex. Not surprisingly, due to pressure to conform lest they lose their desirability to men and capacity to bear children, Victorian women retreated inside to do needlework. Some envied the boys, though. A woman in 1899 wrote, “The boys were lucky. They did gymnastics. They exercised. They were allowed to romp around freely... Snow and ice was theirs in the winter, the lake in summer. We girls didn’t do gymnastics, we didn’t swim... We weren’t allowed to have snowball fights, not even to skate. Remember, the knitted sock was still in its heyday.”³⁵

The consequence of banishing women from a life outside of the home was they learned physical weakness. “By not being allowed to develop ‘the strength of body on which strength of mind in great measure depends,’ girls and young women... were being made weak. Unnaturally weak.”³⁶ Making matters worse was the fact that women knew little about how their own bodies worked and did what their doctors told them to do.³⁷ A doctor in a meeting of the Obstetrical Society in 1867 remarked, “... we have constituted ourselves, as it were, the guardians of... [women’s] interests... We are, in fact, the stronger and they the weaker. They are obliged to believe all that we tell them and we, therefore, may be said to have them at our mercy.”³⁸ Sufficiently persuaded as girls to stop running and jumping, in the mid-to-late 1800s, an alarming number of middle and upper-class women in the United States came down with “hopeless invalidism.”¹ Those afflicted were habitually ailing, suffering from symptoms such as constitutional weakness, feebleness, lack of vigor, and depression. It is now known that most of these women were suffering from disuse atrophy, defined as the partial or complete wasting

¹Not surprisingly, lower class women were not prone to this disorder since most had no choice but to remain active to support their households.

away of muscle and bones, caused by a chronic lack of exercise of sufficient intensity or volume, similar to having a body part in a cast.³⁹ Women in 19th century America who had adhered to their doctor's advice had unwittingly allowed "... muscles in some parts of the body [to] dwindle till they became useless."⁴⁰ Women unintentionally fulfilled the prophecy of the weaker sex.

Making matters worse, when women complained to their doctors, physicians prescribed constant rest as the cure, which exacerbated their frailty. The "rest cure" lasted for eight weeks, during which women were not allowed to sit up in bed, read, write, or get visits from friends.⁴¹ So according to 19th century physicians, to prevent weakness and infertility, women should do nothing, but once they became ill, they should continue to do nothing. This circuitous logic placed women in a powerless position that was especially difficult for women to overcome since it became a vicious circle; women's behavior made the belief true, and observations of women's behavior in turn increased belief. Equally detrimental, when physicians searched for the cause of the epidemic plaguing women, they came to the conclusion that female maladies were inherently pathological, "diseases" intrinsic to being a woman.⁴² Thus, frailty was genetic and had no cure. Some modern day scholars have dubbed this 19th century philosophy, "The Frailty Myth."⁴³

Maintaining Frailty

In tracing the frailty myth back to the 19th century, scholars found an inevitable connection between attitudes at the end of that century and modern-day perceptions regarding women's bodies and appropriate behavior, resulting in a continuum of actual physical oppression in which women have been kept weak. More and more, scholars began to see that the frailty myth had not died, "it had only wedged its way a little further underground," becoming so systematically entrenched that it could fairly be called a hoax.⁴⁴ Regardless if society constructed the myth to consciously deceive women, or accepted the myth's rhetoric as truth, the

idea that women were biologically and irreversibly weak took permanent root. As such, in modern times it has manifested itself in many ways, such as substandard physical education for girls, limited access to athletic opportunities, poor physical conditioning and health, misconceptions about women's ability to strength train, and the emergence of gender-based physical fitness standards in schools and the military.⁴⁵ While on the surface the gender-based standards may seem like a fair approach to mitigating the physiological differences between men and women, the actual biological differences between the sexes are often exaggerated, do not warrant such differentiation, and actually do harm. According to gender studies experts, although stereotypes about the perceived differences between men and women are often based on flimsy evidence, most people take them seriously, which damages relationships and careers.⁴⁶

Even though the benefits of exercise for women gradually became apparent during the 20th century, "institutions continued to 'protect' women through rules limiting exertion."⁴⁷ Only "feminine" forms of exercise were taught or accepted. Exercise regimens developed for women were meant to "correct female form" and "better fit women for work in the home."⁴⁸ Although American schools eventually added a physical education (PE) requirement for girls to their curriculum, girls PE was segregated and inferior to that of the boys. By design, physical education for girls did not promote or encourage *rigorous* exercise, *aggressive* play, or *competitive* participation in sports. Female physical educators in particular had an almost monopolistic hold over girl's and women's sports. They and fostered a "female model" of sports that had femininity as its goals; intense, sweaty, all-out competition was too masculine. They devised "girls' rules" and reduced the size of playing fields and courts. They also published numerous articles, criticizing organized sports for girls in *The American Physical Education Review*, the physical education teacher's bible.⁴⁹

Throughout most of the 20th century, many schools that boasted elite high school male athletic teams had no interscholastic athletic programs for girls. According to Fitness Research Director, Wayne L. Westcott, PhD, in the late 1960s, “It was simply assumed that high school girls did not have the physical or emotional capacity to participate in competitive sports. Although girls were required to attend physical education classes, they had the impression that vigorous exercise and competitive sports participation were male activities.”⁵⁰ While boys had excellent sports experiences, these opportunities were absent for the girls. “The boys [participated in] physical conditioning programs in preparation for sports competition, but the girls never had this experience. They were considered the weaker sex, and they had little opportunity to change this perception.”⁵¹ As such, schools established gender-based physical fitness standards based on real and imagined physiological differences between the sexes, advocating a “different but equal” approach. The resulting standards were not just different, but substantially lower, for girls.⁵² Instead of helping girls develop awareness and confidence in their physical abilities, schools establish gender-based standards that condition the belief of inherent female weakness since the criteria for boys is not just different, but higher. Just like the “rest cure,” the PE classes, lacking in rigor, only served to preserve the myth.

Although many girls and women never questioned the reason sports were off limits to them because gender conditioning was far too entrenched, there were always some women who wanted to participate in sports. Some kept it secret, like some perverse desire, while others forged ahead. Those who did were ridiculed and adequate facilities withheld. They were also reminded of the health risks. When American women took up field hockey in the early 20th century, health professionals warned it would deprive girls the ability to breast feed later in life.⁵³ Additionally, from the time Little League was founded in 1939, little girls wanted to play

ball but were not allowed. In fact, when League officials faced federal pressure in the 1970s to end discrimination against girls, they opted to suspend games rather than let girls play and spent almost \$2 million fighting to keep girls out. One attorney for the inclusion of girls in Little League said the backlash mirrored the hostility and fanaticism of right-to-lifers.⁵⁴ Additionally, like their Little League counterparts, the male-run International Olympic Committee absolutely prohibited women's participation in the Games, considering it "animalistic." The prevailing view was that women were not up to the demands of Olympic competition. "No matter how toughened a sportswoman may be, her organism is not cut out to sustain certain shocks," one educator proclaimed. Moreover, women's encroachment into the Olympics reinvigorated the fear of masculinization. The New York State Director of physical education opined, "Manly women... may constitute nature's greatest failures which should perhaps be corrected by as drastic means as those by which the most hideous deformities are treated."⁵⁵ Even Pope Pius XI weighed in by spelling out his opposition to girl's athletics in a letter to the vicar of Rome.⁵⁶

Despite the proselytizing of educators and the Pope, society could not contain women's rising interest in rigorous exercise, aggressive sport, and high-level athletic competition.⁵⁷ The women's movement in the 1970s, and Title IX, a section of the Educational Amendment Act of 1972 that mandated equal funding for girls' sports, allowed many women to overcome traditional socialization and gender discrimination, and participate more freely in sports and exercise.⁵⁸ Despite these successes, vestiges of the frailty myth still exist. Well into the 1970s, girls were excused from gym class during menstruation.² Additionally, even though Title IX was passed in 1972, the law was not enforced until 1988, and girls did not begin to get equal funding until the 1990s, and sometimes still do not.⁵⁹ "The struggle to get a physical education equal to men's

²It was not until 1994, after women had entered sports by the millions, that the American College of Obstetricians and Gynecologists published a technical bulletin rescinding its previous advice, stating that exercise was beneficial to pregnancy and helped regulate the menstrual process vice threaten it.

has been longer and harder for women than gaining access to an academic education.”⁶⁰

Moreover, gender-based PE standards persist, and these standards have been adopted by the USMC.⁶¹

Adopting Frailty: The Myth and the Marine Corps

The Marines Corps, like society, was not immune to mythology and has been slower at adapting its physical standards to reflect women’s actual capacity. This is not surprising considering the manner and circumstances in which women were integrated into the US military. In keeping with the tradition of encouraging female strength only when the country needs it, “Woman-power” was used to meet the Corps’ unprecedented demands for personnel in 1918 during WWI.⁶² Following the war, officials inactivated and separated women from the USMC by 1922. The nation no longer in crisis, society no longer considered their services outside the home essential. Much the same happened in WWII; a shorthanded country could not disdain woman power. Even though woman’s appropriate place was still in the home, the war was much bigger than any before, consisting of many fronts around the globe. Officials once again recruited women, and over 20,000 answered the call, “Free a Marine to Fight.”⁶³ Despite women’s noteworthy performance during the war and desire to continue serving, military officials planned to again inactivate them once their services were no longer essential. In 1945, Brigadier General G. Thomas stated, “The opinion generally held by the Marine Corps is that women have no proper place or function in the regular service during peacetime... the American tradition is that woman’s place is in the home... and women do not take kindly to military regimen.”⁶⁴ Congress, however, realized it was wise to retain some women in the military during peace time and passed the Women's Armed Services Integration Act on 12 June 1948, making women a permanent part of the USMC.

Even though women managed to establish a permanent presence in the USMC after WWII, the Corps did not develop or use them to their full potential due to prevailing societal norms and misconceptions. It was hard for society, much less the USMC, to accept women filling non-traditional roles, even though serving in the military in itself was “non-traditional”. Thus, “a policy of having women in combat was almost unthinkable.”⁶⁵ Moreover, women were not seen as *capable* of executing rigorous tasks. “In 1948... Congress believed combat required physical strength that women did not possess.”⁶⁶ As such, only military occupational specialties (MOSs) and duty assignments that did not require rigorous physical activity or pose occupational/combat hazards were open to women. For this reason, women were typically assigned to administration or supply specialties and most were not permitted to deploy.⁶⁷

Since women were viewed as incapable of being “real” Marines, the mission of boot camp was to “produce a basic woman Marine who [was] able to function effectively in garrison.”⁶⁸ Consequently, leaders were not compelled to institutionalize physical fitness training or standards for female Marines- physical fitness was not necessary to type, file paperwork, or answer phones. Fitness was expected to be maintained through voluntary activities, and leaders did not give women the time during the work day to conduct physical training. Moreover, “[a]ny indication of masculinity was unacceptable; athletic women were suspected of being lesbians.”⁶⁹ Specifically, in 1964, the Marine Corps convened a study group to examine the role of women in the USMC, which concluded, “In accordance with the Commandant’s desire, [women Marines] must... be the most attractive and useful women in the four lines of services.”⁷⁰ Accordingly, recruit training for women from 1949 to the 1970s resembled more of a charm school than boot camp. Drill instructors issued elaborate make-up kits to recruits and the program of instruction included courses like “Image Development,”

which taught women about “the proper application and reapplication of cosmetics throughout the day.”⁷¹ Additionally, the final evaluation at boot camp was social vice tactical or physical in nature. Selected individuals from the recruit depot were invited to participate in a social event where recruits were judged on poise, courtesy, and appearance.⁷² In 1973 Master Gunnery Sergeant Hawkins recalled her final evaluation during boot camp, “We had to entertain them with coffee and make chit chat and show that we could hold our bearing.”⁷³

From 1949 through the 1970s, recruit training for women remained largely unchanged since women’s roles in the Marine Corps continued to be limited, yet the Vietnam War and the Women’s Movement in the 1960s dramatically and permanently changed the status quo.⁷⁴ The war in Vietnam was so unpopular with the American public that in order to reduce the number of men that had to be drafted, in 1967 officials lifted the cap on how many women could volunteer (previously, women could not constitute more than 2 percent of the force). In order to entice more women to join, officials made military life fairer and more attractive by opening more MOSs to women and lifting command and grade restrictions (previously women could not be promoted above the rank of lieutenant colonel).⁷⁵ Luckily for America and its military, the success of the Women’s Movement made women working outside of the home more acceptable. The next substantive changes regarding women occurred when the Vietnam War ended and the military became an all-volunteer force in 1973.⁷⁶ Fearing not enough men would enlist to adequately fill the many MOSs still not open to women, in 1975 the Corps approved the assignment of women to all occupational fields except those related to direct offensive combat. Women were also assigned to the Fleet Marine Force and allowed to deploy to combat zones.⁷⁷

Since the unprecedented new career opportunities included labor intensive MOSs and included the possibility of “defensive combat”, in 1969 the USMC created the first PFT

requirement for female Marines (see figure 1).⁷⁸ Even though this was an important first step, the PFT standards merely reflected society's misunderstanding of women's physical potential. For the most part, female Marine's physical training was "designed to keep women trim" and mimicked high school gym classes, which usually included a series of stretching exercises and a sports activity such as volleyball.⁷⁹ According to one retired general officer, "Ruggedness was certainly not the name of the game- good health and appearance were."⁸⁰ Most notably, female Marines were held to a lower physical standard on the PFT than male Marines because meeting the men's standard was either thought impossible for women or would presumably require a much higher level of effort from a woman than from a man. This basing of PFT physical fitness standards on women's presumed physical handicaps is known as "gender-norming"⁸¹ Since the PFT's inception in 1969, a more democratic understanding of women's capabilities gradually developed due to Title IX and women proving their physical prowess in high-level competition. As a result, the USMC responded by modifying the PFT on three occasions (see figure 1). Today the PFT for women consists of a three-mile run, abdominal crunches, and the FAH (see table 1).⁸² Although the female PFT standards have improved over the years to include a more appropriate evaluation of abdominal strength and cardiovascular endurance, it is still a "gender-normed" version of male PFT standards (see table 1). Specifically, unlike the male PFT, which requires pull-ups, the metric to test upper-body strength for women is still not rigorous enough to properly prepare them for their expanded roles in the Marine Corps' primary mission of war fighting.⁸³ Like the PE courses for school-aged girls, the PFT has been unnecessarily "dumbed down," creating women who are not fit for combat and a potential detriment to their unit.

The need for another "modification" to the USMC's PFT was never more clearly evident than in 1990 when more than 40,000 servicewomen- over 1,000 of which were female Marines-

deployed to Southwest Asia during Operations Desert Shield and Desert Storm. Operation Desert Storm placed women at close proximity to front-lines, greatly increasing the likelihood and severity of occupational hazards.^{84 85} The war proved that policy-makers could not insulate women from the hazards of combat simply by classifying some jobs as “non-combat” specialties. Thirteen servicewomen were killed and two were prisoners-of-war. Further, over the last decade, Operations Enduring Freedom and Iraqi Freedom have painfully and profoundly demonstrated the same fact, during which a total of 145 female service members died on the non-linear battlefield.⁸⁶ Since the PFT standards for women were never appropriate to properly prepare women for the “possibility” of defensive combat in the first place, the virtual “certainty” of women participating in combat not only renders old training requirements insufficient, it underscores the importance and urgency of a new metric for women and the Corps as a whole.

The Flexed-Arm Hang- A Second-rate Strength Metric

Like male Marines, practical strength training should be a focus for women’s training, yet there is little evidence for the validity of the FAH. It has poor correlation to upper-body strength and is a non-functional movement military. In Oct 1975, a HQMC news release stated that the “WM [woman Marine] PFT was Revamped” to include the FAH, but scientific reasons for choosing the FAH were not given, and no record of testing was available at the HQMC History Division. Officials likely chose to include the FAH since it resembled a pull-up, which was the male requirement, and because they likely had familiarity with the FAH since it had been a part of the President’s Physical Fitness Challenge for school-age girls since the 1960s.⁸⁷ The lack of validity of the FAH is evident in the manner in which it is executed: female Marines are allowed to have assistance in assuming the FAH position, eliminating the need for women to lift their own body weight. Additionally, women’s chins do not have to remain above the bar- female

Marines are required to keep only a slight bend in the arm at the elbow while hanging on a bar for a minimum of 15 seconds to pass and 70 seconds to max (see figure 2).⁸⁸ Essentially, the FAH measures what it looks like it measures- the ability to hang vice pull the body through resistance. Additionally, research demonstrates the “FAH has a weak correlation to absolute muscle strength and endurance in dynamic tasks.”⁸⁹ The reason is the FAH is a static exercise that requires only an isometric contraction of the muscle whereby no appreciable change in the length of the muscle fiber occurs.⁹⁰ Since tension but no movement is generated through the isometric contraction of the muscle, holding the FAH position will only help develop the strength to hold oneself in that position.⁹¹ Thus, training for the FAH elicits little enhancement of the strength needed to perform dynamic military tasks. Rather, in practical terms, it correlates to being able to hang on the edge of a wall or vehicle.

Instructors at Officer Candidates School (OCS) are aware the FAH is a non-functional military movement that has little utility in a combat environment. OCS officials state, “The Marine Corps uses the FAH to provide a general measure of a female’s upper-body strength. However, this strength test does not accurately assess the candidate’s ability to negotiate the numerous obstacles and courses which are used by OCS...”⁹² Consequently, OCS advises prospective female candidates to “develop their back, shoulders, arms, and chest muscles” instead of practicing just the FAH. Significantly, an unofficial sampling of two OCS classes correlated the ability to do at least one pull-up with higher graduation rates. Of the candidates who could perform at least one pull-up, 82 percent graduated. Of those who could not do one pull-up but could achieve a 70-second FAH, only 32 percent graduated.⁹³ While physical fitness is only one component of OCS, female upper body strength dramatically increases women’s chances of completing OCS since successful negotiation of the obstacle course is a prerequisite

to graduate. Since the obstacle course is designed to simulate the kind of tactical movement Marines may use in battle, the applicability of pull-ups to combat is obvious.

The Pull-up- A Superior Strength Metric for Women

Recognizing the flaws in the current PFT standards for women Marines, the 2010 Sergeants Major Symposium recommended that the FAH be changed or replaced. The Commandant of the Marine Corps agreed and in October 2010 directed the Commanding General of TECOM to examine alternative upper-body strength tests for females, with the guidance that, “Any replacement or modification to the FAH will be... a test of upper body capacity rather than skill.” Further, “Training for the test will cause physical adaptations that enhance a Marine’s function in military tasks and activities of daily living.”⁹⁴ Supported by the Office of Naval Research through the Naval Health Research Center, TECOM studied push-ups and pull-ups as alternatives. Ultimately, TECOM recommended pull-ups be added to the female PFT as the preferred course of action since push-ups were more appropriate for testing muscular endurance vice muscular strength.^{3 95} On the other hand, the pull-up was deemed a reliable test for measuring upper-body strength and is valid for occupations that require one to manipulate his or her body weight.⁹⁶ The reason is the pull-up is a dynamic movement that tests all three types of contractions in a muscle: concentric (tension through the muscle fibers while in a shortened state), eccentric (tension through the muscle fibers while in a lengthened state), and isometric.⁹⁷

According to Harvey Newton, former executive director of the National Strength and Conditioning Association, when compared to the FAH, a pull-up “would transfer to more specific strength that might be crucial in a ‘life or death’ situation.”⁹⁸ As a functional movement,

³Other disadvantages were that push-ups would facilitate disparity with male Marines, require new monitor testing, would be more prone to subjective grading standards, and invite service comparisons/criticisms.

training for pull-ups would translate to practical tasks essential to being a war-fighter, such as the ability to lift oneself over a wall, through a window, or on and off vehicles. Additionally, an overall increase in upper-body strength would allow women to better support the weight of protective gear and assist with evacuating casualties. John Allstadt, physical trainer and athlete, would agree with adding pull-ups to the PFT, “Pull-ups have long been a staple exercise in the training of a wide variety of strength athletes... chin-[ups] and pull-ups build tremendous strength... and power in virtually every muscle of the upper body. The lats, shoulders, biceps, forearms, and grip are all thoroughly taxed with a good set of pull-ups.”⁹⁹ Clearly, the USMC already understands the value of the pull-up; it has been a part of the male PFT since 1969.¹⁰⁰

Unlearning Weakness: Real versus Perceived Handicaps

Although the validity of pull-ups is well established, there is considerable resistance to making the pull-up a requirement for female Marines because of the frailty myth. There is an enduring assumption in society and the USMC that women should not be required to perform pull-ups due to physiological and anatomical handicaps that place women at a disadvantage, preventing most women from accomplishing even one repetition.¹⁰¹ When interviewed, many Marines answered that it is simply not reasonable to expect the average woman to perform pull-ups due to a genetic predisposition for weakness and other physical shortcomings.¹⁰² One female sergeant asserted that, “Women should not be required to perform pull-ups because... when you look at the majority of females, most do not have the upper-body strength of a man unless they’re GI Jane...” A male major stated that requiring females to perform pull-ups would put them at a disadvantage since “physiological differences make [pull-ups] a more difficult standard.” Contrary to what many men and women believe, however, the inability of (some) women to perform pull-ups is not due to genetic shortcomings. Rather, women lack physical

conditioning and practice, vice inherent biological ability. Since most “girls participate, perform, practice, compete, and behave exactly as society expects[,] the result is reduced levels of physical activity and practice, in turn resulting in lower levels of health-related physical fitness and sports skills.”¹⁰³ Although less perceptible than in the 19th century, girls are still learning weakness and its effects are as profound as they are under recognized, proof of the enduring nature and influence of the frailty myth.¹⁰⁴ Even in present-day, the methods that encourage weakness and inactivity in women begin in childhood.

Women Have the Strength, but Lack the Conditioning

Beginning in infancy, many girls learn to be weak from both parents, who unwittingly “elicit gross motor behavior more from their sons than their daughters.”¹⁰⁵ In the 1990s, a study of parents interacting with their one to two-year-old children found, “Girls got positive reactions when they played with dolls... [but]... got negative reactions for running, jumping, and climbing.”¹⁰⁶ Essentially, learned female frailty “begins in the cradle, and it is something girls are taught.” Even though most parents are not fully aware they reinforce gender conditioning and passivity in their girls, the effect is clear: by age three, children already know the rules for gendered behavior and start thinking it is wrong to engage in cross-gendered activities; by age four they know playing with dolls is appropriate for girls and sport is appropriate for boys (see figure 3). Thus, most boys start developing strength and sports skills when they are four or five-years-old, while girls do not, which means girls are “behind from the get-go in learning the skills needed for physical competence.” It is because of this phenomenon that researchers came to the conclusion that gender bias actually affects girls’ motor development.¹⁰⁷ “When little girls are not given equal opportunity to play- or if they withdraw from opportunity because of what

they've learned about what is 'appropriate' - they fall behind in learning motor skills. Strength and agility come from *doing* [emphasis in original], after all."¹⁰⁸

Although it is finally recognized that unless high-activity play is built into school curriculum girls do not get the large muscle stimulation they need for normal development, most girls are still not being encouraged in school.¹⁰⁹ Despite proof of women's physical prowess in the Olympics and professional sports, PE teachers still give more positive attention and encouragement to boys and assume PE is less important for girls. A number of studies in the 1990s found that schools were still "dumbing down" the PE courses for their female students."¹¹⁰ Interviews with male and female teachers, school staff, physical education (PE) advisors, and PE department heads led to the dismal conclusion that methods of PE classes remained "traditional", still centered on supposed standards of feminine behavior and appearance (too much rigorous exercise would make girls masculine). Most strikingly, the teachers still had strong assumptions about perceived differences in the natural physical ability of girls and boys- "assumptions that directly influenced their teaching."¹¹¹

Making matters worse for women is rigorous and continuous physical activity is arguably more crucial for developing girls than boys.¹¹² Until age fourteen, strength in muscle and bones increases for boys and girls at a linear rate. After puberty, however, the rate slows for girls- and for sedentary girls may actually decrease.¹¹³ In particular, the bone densities of girls who do not exercise continuously and rigorously (and remember most do not) fall dramatically. By the age of 16, unfit girls have already lost bone density in the spine.⁴ In the brief period between 14 and 16 when many girls stop exercising due to society's promotion of a small, frail body as feminine, girls turn themselves into prime candidates for osteoporosis. At a time when they are supposed

⁴Like bone strength, aerobic power in adolescent girls decreases steadily into adulthood, but is reversible with aerobic training. The trend of decreasing VO2 max is not observed among males of the same age span.

to be gaining bone and muscular strength, they are losing it. Fortunately, according to the President's Council fitness report and a study published in the *Journal of Bone Mineral Research*, this trend can be reversed if girls participate in daily physical activity. Physical education teachers can counter the gender conditioning done by parents and society by teaching girls "physical intelligence" (the physical skills required to develop strength) and encouraging them explore their athletic potential.

Since the cult of invalidism and historical bias against girl's physical development is still present in contemporary teaching, a 1996 Surgeon General's Report on Physical Activity and Health found that young females between twelve and twenty-one are twice as likely to be sedentary as young males, since most non-exercising girls grow up to be non-exercising women.¹¹⁴ Despite this trend, it is never too late for women to reverse the decline in strength and bone density. The lack of adequate and rigorous physical training in adolescence merely *illuminates* the reasons (some) women are weak; it is not a circumscription to remain frail. Female Marines, especially, have a genuine and urgent need to improve their strength and the Marine Corps should lead the way in requiring them to do so.

Women Have the Ability, but Lack the Skill

Also contributing to the reluctance to incorporate a pull-up requirement into the female PFT is the observation that not many women can perform pull-ups and they seem to be easier for men to master. As a result, women are assumed to lack the ability for such a feat. Pull-ups, however, are a "skill", which is something that can be learned and is modified by practice, whereas an "ability" is a relatively stable trait having to do with biological processes of growth and maturation, one that remains more or else unchanged by practice.¹¹⁵ Not surprisingly, since most eighteen-year-old boys in America have spent far more time than girls playing vigorous

sports and participating in other activities “which use and stimulate the development of strength,”¹¹⁶ motor skill studies find that boys have a greater ability to “move with an integrated body pattern’ during throwing, catching, and kicking” than girls.¹¹⁷ Prior to the 1970s, most researchers believed this was due to natural ability vice skill, evidence of boys’ physical superiority to girls. Due to a merger in research on neural control and motor behavior, scientists began to study to what degree scores on motor skill tests were affected by differences in what subjects learned versus natural differences in male and female abilities.¹¹⁸ These studies led scientists to the astounding conclusion that boys’ greater physical skills were chiefly the result of learning and practice. They were not a matter of “superior” physiology.¹¹⁹ Hence, as the “mystique of motor brilliance was penetrated, a more democratic understanding grew about what people can do.”¹²⁰ Specifically, in 1996 researchers learned that the influence of practice accounted for gender differences in “the much ballyhooed skill of throwing a ball.”¹²¹ They did so by making a comparison of dominant and non-dominant throwing arms in school-aged children. The results indicated that second grade boys threw 72 percent faster than second grade girls when using their dominate hand. When the non-dominant hand was compared, however, there were no differences in how fast boys and girls threw.¹²² Thus, throwing is learned; like the ability to perform pull-ups, boys are not born with it. Moreover, like throwing a ball, learning to do a pull-up is a skill attainable for women.

Absolute versus Relative Strength

Unfortunately, unaware that women’s lack of training and conditioning are the greatest contributing factors to their performance of pull-ups, many remain convinced that women should not be expected to perform pull-ups because they are weaker than men. In relative terms, however, women are essentially as strong as men. Observed gender differences in absolute

muscle strength mostly reflect differences in lean muscle quantity (vice quality).¹²³ Research on the muscular strength of over 900 average adult men and average adult women revealed that in absolute terms, not surprisingly, the male subjects were about 50 percent stronger than the female subjects. This was not an accurate or fair comparison of muscle strength, however, because the men weighed on average 50 pounds more than the women. To better understand the strength abilities of men and women, the researchers divided the weight the subjects lifted by their lean (muscle) body weight. In doing so, they discovered the women could perform on average the same number of exercises with the same amount of their lean weight as the men.¹²⁴ Thus, while it is true that individuals with the largest muscle cross-sections generate the greatest absolute force, when it comes to relative strength, “comparison of men and women for strength using a ratio score with lean body mass as the divisor considerably reduces, if not eliminates, the large absolute value strength difference between genders.”^{5 125} Thus, comparisons of male and female strength that do not take biomechanical measurements into account, such as an individual’s size and lean muscle mass, are crudely determined and misleading.¹²⁶

More importantly, women do not *need* to be as strong as men, whether in absolute or relative terms, to learn how to perform a pull-up.¹²⁷ According to Stewart Smith, former Navy SEAL and professional physical fitness trainer, “One of the worst things we ever developed in physical fitness classes [was] the ‘girl pull-up’ or flexed-arm hang. At an early age, we have been telling young girls that they cannot do regular pull-ups because they will never be as strong as boys.”¹²⁸ Yet women need only be strong enough to lift their own body weight relative to their size. In the words of Dr. George Colfer, who has a Ph.D. in kinesiology and health,

⁵For example, a man who weighs 210 pounds can bench-press 250 pounds, while a woman who weighs 132 pounds can bench-press 154 pounds, or only 62% of what the man can lift. In absolute terms, the man is stronger. But when the bench-pressed weight is divided by the body weight of each, it yields values of 1.19 and 1.17 respectively. Thus, the ratio score reduced the percentage of difference in bench-press strength to only 2.4 percent.

“Relative strength is the amount of strength in relation to one’s body weight. The importance of relative strength, in regards to health-related fitness, lies not in how much you can ‘lift,’ but rather in how efficiently you can move the body weight you are carrying.”¹²⁹

Female Muscle versus Male Muscle

Since many women and men are unaware of the existence and significance of relative strength, many believe the strength differences between the genders are attributed to men’s superior muscle quality. As a result, many believe women’s inferior muscle quality prevents her from developing more strength, and that strength training may actually be detrimental to women’s musculoskeletal system. These assumptions are categorically untrue, however, and need to be corrected.¹³⁰ Numerous studies have demonstrated that there are no differences in the quality of male and female muscle tissue, it is essentially identical.¹³¹ As previously stated, differences in absolute strength are attributed to greater muscle mass. Further, studies have shown that a woman can adapt to resistance-training in the same way as a man. In fact, women typically add three pounds of muscle after two months of basic strength training. Additionally, the results of a comparative study between an average adult man and woman who followed similar strength training programs using the bench-press exercise demonstrated that each increased their bench-press strength by approximately 18 percent in a five-week training period. “On a pound-for-pound basis with respect to both their body weight and their starting loads, there were no differences between the male and female responses to the strength exercise.”¹³² Such findings strongly support the argument that women can train to perform pull-ups since few if any differences exist in the quality and responsiveness of men and women’s lean muscle mass.

Significantly, in the performance of pull-ups, the only noteworthy disadvantage women have is a lack of physical conditioning and practice. In fact, since the pull-up exercise requires one to move his or her body against gravity, there is a negative correlation between pull-ups and body weight. Thus, hypertrophy (enlargement of muscle) is not necessary to learn how to perform pull-ups, and may actually be detrimental if the rise in mass negatively alters the strength to fat-free mass ratio.¹³³ Therefore, lighter Marines who train for maximum strength actually have an advantage in the performance of pull-ups. Moreover, even women who lacked strength conditioning at an early age can learn to perform pull-ups with a surprisingly simple training program (see Appendix A). Pull-ups require practice, like throwing a ball.

Finally, there are no biological handicaps that put women at risk when they participate in strength training; women enjoy the same health and performance benefits as men when they strength train.¹³⁴ Rather than harm a woman's musculoskeletal system, strength training is highly beneficial to it. Women experience increased functional strength, increased lean muscle mass, decreased nonfunctional body fat, higher metabolic rates, enhanced bone strength, stronger connective tissues, increased joint stability, decrease risk of osteoporosis and injuries, and improved self-esteem and confidence.¹³⁵ Since health and performance benefits are equal for both men and women, there is no reason to advocate different training techniques. This includes the performance of pull-ups. Personal trainer, Will Brink, agrees, "Consequently, women should strength train in the same ways as men, using the same program design, exercises, intensities, and volumes, relative to their body size and level of strength, so they can achieve the maximum physiologic and psychological benefits."¹³⁶

The recent TECOM female PFT study supports the theory that women can and should be required to perform the same exercises as men. In the spring of 2010, TECOM tested 318

female Marines' ability to perform pull-ups from fifteen units across the USMC. Participation in the study was voluntary and limited to fit-for-full duty females, and the sample size was large enough to generalize performance for all female Marines. The group represented the average female Marine, with the PFT/FAH scores of the study sample slightly below the USMC average (see table 2). Thus, the female Marines tested were not *elite* athletes, nor were they required to physically train for the study since the purpose was not to test the effectiveness of a particular workout. Rather, it was to test female Marines' current capacity for pull-ups.⁶ The results demonstrated that 43.2 percent of the study sample was able to perform at least one dead-hang pull-up, and 21.5 percent could perform three or more dead-hang pull-ups (see figure 4). Significantly, nearly half of the study group was able to accomplish at least one pull-up even though more than 60 percent of the women tested reported that they had trained sporadically or not at all during the six weeks before the test. Anecdotal reports from West Point and the Virginia Military Institute support the results of the study, since approximately 60 percent of females are able to do at least one pull-up and induction.¹³⁷ Although not every Marine tested could perform pull-ups, it is reasonable to assume with strength training and practice, performance of the pull-up would improve (see Appendix A).

Mental versus Physical Strength

Although physiological data on women's physical abilities and results from the TECOM female PFT study prove that women are capable of performing pull-ups, the Marine Corps recently decided against adding a pull-up requirement to the PFT for women Marines; the Corps' reluctance suggests a psychological aspect of the frailty myth that is harder to overcome than the physical. It seems more detrimental than the lack of strength training and practice on (most)

⁶TECOM forwarded the participants a recommended workout but did not require them to use it.

women's failure to perform pull-ups is their *belief* that they cannot do it.¹³⁸ Thus, in addition to fostering learned weakness, the frailty myth has affected women's sense of competence. Just the *absence* of a pull-up requirement for female Marines on the PFT is enough to convince women *and* men that pull-ups are virtually unattainable for female Marines. The existence of the FAH is enough to dissuade most female Marines from trying to learn pull-ups; not knowing the extent of their strength and endurance, women do not dare find out.¹³⁹ Significantly, modern cognitive motivation theories nearly all highlight the importance of *expectations* and the individual's interpretation of his or her capabilities. "That is, what the person thinks is important, *is* important. If you expect to do well at volleyball, you will... if you expect to fall off the balance beam, you probably will," says Diane Gill, a professor of exercise and sports science.¹⁴⁰ Similarly, if a woman expects the fail at pull-ups, she probably will. Further credence is given to the deduction of women Marines' inherent weakness since indoctrination of female weakness and gender based standards began for most Marines began in adolescence.

Like Marines, children's expectations are to a large extent molded by expectations and standards. "Many girls get the message early that athletic competence isn't expected of them. They don't feel physically competent to begin with, and unless someone takes pains to convince them otherwise, they assume their frailty is inborn... it's nature." In fact, girls as young as four learn and adopt a false sense of their physical capacity; they perceive themselves to be weaker than boys, and boys perceive themselves as stronger than girls, although no actual difference in strength exists. Significantly, making girls aware of their gender has the potential to seriously undermine their physical performance. This concept is known as "gender threat." When it is suggested to girls that they are acting like boys, many will subconsciously curtail their movements, resulting in poorer physical performance and conditioning.¹⁴¹ Additionally, in a

survey of third to sixth graders, girls scored only two percent lower than boys on a battery of motor tests, but they self-rated their skills as fourteen percent lower.¹⁴² Further, another study shows that “nine-year-old boys and girls are virtually identical in anaerobic performance... Yet girls don’t think so.”¹⁴³ Since by age eight or nine children’s notions about their physical capabilities are already well developed or established, many perceive trying as futile since failure is automatic.¹⁴⁴ Parents’ perceptions, wrong though they may be, lower girls’ feeling of adequacy and predilection for participating in sports and physical activities.

This stunning influence on boys and girls expectations can also be traced directly to different criteria used to test their fitness.¹⁴⁵ One research group wanted to find out if there were enough differences to warrant such discriminatory practice. A group of children were all tested on the same events and best effort was expected. When the authors tabulated what percentage of girls met or exceeded the higher criteria set for boys, the girls came out ahead of the boys!⁷ They also found maximal heart rates, strength and muscular endurance, and maximal oxygen consumption (best single indicator for cardiovascular endurance) were similar when measured with body weight factored in, for prepubescent boys and girls.¹⁴⁶ If data from several studies have found no significant differences between boys’ and girls’ performances on fitness tests, why then are standards noticeably different for boys and girls of the same age?¹⁴⁷ The answer is the same reason the standards are different in the USMC- gender conditioning and the influence of the frailty myth lead to prejudice.

The psychological effect of the frailty myth is so entrenched that Marines irrationally cling to their prior assessment of women’s capabilities even when faced with conflicting evidence. For example, a female Captain claimed pull-ups would be an unfair requirement even though she knew several women who could perform them, “Women’s builds are not normally...

⁷The test consisted of a one-mile run, sit-ups, pull-ups, and sit-and-reach.

conducive to upper-body strength, therefore making [pull-ups] more difficult to achieve...”¹⁴⁸ A male major who was interviewed knew a female Marine who could perform not just a few pull-ups, rather, she could complete twenty dead-hang repetitions. Yet, he claimed she was a “mutant freak” and was lying about not having been a gymnast, weight lifter, or athlete prior to joining the USMC.¹⁴⁹ Further, many of those interviewed that had “heard” of female Marines who could perform twenty or more pull-ups, but had not witnessed the feat themselves, either referred to the women as “mythical beings” or dismissed their achievement, assuming they had cheated (by kipping), the quantity was exaggerated, or that the rumor was categorically false.¹⁵⁰ Thus, even the Marines that *knew* women who could perform pull-ups assumed it was the “exceptional” or “abnormal” females that had somehow defied nature and acquired the skill, rather than question their original assumption that as a gender, women were physiologically handicapped. Supporting their belief was the fact they only knew a *few* women who could perform pull-ups. The fallacy in this logic is that the Marines assumed *most* women had tried and failed to perform pull-ups, when in fact not many female Marines had even made the attempt due to the absence of a standard. Thus, the USMC’s PFT criteria reflect as well as strengthen what most Marines have been taught at an early age, and even female Marines performing pull-ups is not enough to dispel the myth. On the other hand, a tougher PFT metric for women would shatter the misconceptions.

Relearning Strength: Establishing Gender-Neutral Standards

Some might suggest that since most women are only as *relatively* strong as men, the PFT standards should be relative as well. This logic is flawed, however, since the PFT tests individual performance against a set standard; Marines do not compete against each other on the PFT. As such, Marines should be judged against a standard that prepares them more properly for

combat, and logic dictates the standard should be universal since combat does not discriminate. Women need to be able to pull their own weight, figuratively and literally, since even if women are barred from offensive combat specialties, they cannot be insulated from defensive combat on the battlefield. Additionally, pull-ups would require female Marines, like male Marines, to lift their own body weight and the force required would be relative to their own size, making a gender-normed strength metric unnecessary. Further, since lifting capacity shows the greatest gender disparity, a more optimal strength-metric on the PFT would help improve women's absolute strength, making them more proficient at their occupations as well.¹⁵¹ Finally, there is an ongoing review of the restriction on women's service, which will likely result in women performing more physically demanding jobs. Since testing drives behavior, if the FAH remains, suboptimal upper-body strength straining will continue.

Additionally, the ability to close the strength gap is not a skill reserved for "physiologically gifted" women. All women possess the ability to excel physically; elite female athletes are elite because they train. Significantly, the difference in athletic potential between ordinary women and elite female athletes is greater than it is between ordinary men and elite male athletes. As an example, the *average* eighteen-year-old female needs 10 minutes and 51 seconds to run a mile, whereas the *average* eighteen-year-old male needs 7 minutes and 35 seconds. The untrained woman is 3 minutes and 16 seconds slower than the untrained man. By contrast, the women's world record holder is only 29.43 seconds slower than her male counterpart; the elite female runner completes the mile in 4:12.56, whereas the men's world record holder completes the mile in 3:43.13. Moreover, during the TECOM female PFT study, the range in the number of pull-ups performed differed by seventeen pull-ups. Significantly, the average number of pull-ups was 1.63, whereas the "top" female pull-up performer executed

eighteen dead-hang pull-ups.¹⁵² By comparison, the average number of pull-ups for male Marines in 2011 was sixteen, whereas “top” male pull-up performers executed twenty.¹⁵³ The gap between the quantity of repetitions performed by female Marines demonstrates that they are farther from their pull-up potential than male Marines.¹⁵⁴

Additionally, historical analysis of elite marathon results over a thirty-year period demonstrates the degree to which women’s athletic performance has been misunderstood. During the period studied, the marathon world record for women improved by 1 hour, 5 minutes, and 21 seconds. During that same period, the male world record improved by only 5 minutes, and 2 seconds. Even though it was once thought that women could not withstand the rigors of long distance running, and the marathon was not added to the Olympics for women until 1984, by the last year of the period studied, the ability gap between men and women was no longer so glaring. The difference in the world’s best was down to 12 minutes, 13 seconds- a 9 percent difference.¹⁵⁵ These changes demonstrate that women have not only been farther from their athletic potential than men, but that they are capable of narrowing the gender gap with training.

Actually, the key question is not the difference in gender averages, but rather how much the performance abilities of men and women overlap (see figure 5).¹⁵⁶ Thus, even though there is a physiological explanation for the gender performance gap observed in endurance and power sports, the gap is a crevice vice a chasm and there is a significant amount of overlap in the potential and performance of the average female competitor and the average male competitor. For example, although on average women typically achieve VO₂ max scores 15 to 30 percent below values of male counterparts, the VO₂ max scores for many women exceed the average values for men, especially for women who train.¹⁵⁷ Significantly, the VO₂ max of female cross-country skiers exceeds scores of untrained males by 40 percent. Additionally, despite women’s

lower average VO2 max scores, the best woman runner can still beat 99 percent of the men.¹⁵⁸ Most importantly, the gender gaps at elite levels are not relevant to whether or not pull-ups should be added to the USMC's PFT; women Marines are still capable of performing pull-ups despite the fact the fastest man will always be quicker than the fastest woman, and the strongest woman never be stronger than the strongest man.

More important than the amount of difference *between* men and women, however, is the genetic potential *among* men and *among* women."¹⁵⁹ Considerable variability exists within each gender; there exists too much genetic variety within the male sex alone to warrant a different standard for men and women. Consider the ancestry of runners holding the top 100 world record times in eight distances- all are of African descent. Known as the African running phenomenon, there are many contributing factors to the runners' success, such as training and environment, yet genetics clearly play a role as well.¹⁶⁰ Male Marines of African descent, however, are not required to run faster on the PFT. Moreover, since many physiological factors conspire in sports performance, genetics are more useful as an indicator of a person's potential or "upper limit" at an elite level and should not be viewed as a restriction or predictor of success. Finally, genetics only contribute approximately 30 percent of a person's capability- 70 percent is due to training, diet, and conditioning.¹⁶¹ Elite athletes are elite because they train. Since the USMC's PFT standards are well below the upper threshold of a Marine's absolute physical potential and male and female Marines to not compete against each other on the PFT, there is no reason to distinguish between the sexes, making gender-neutral standards the only logical choice.

Making the Transition

Modeled after the Service Academies' Candidate Fitness Assessment, the recent TECOM proposal to add pull-ups to the female PFT meets all the requirements for a better strength metric

and ensures the transition to pull-ups would be an incremental process conducted over time. The “hybrid” proposal retains the FAH as an option but makes it impossible to get a perfect score by performing the FAH alone (see table 3). It requires female Marines to attempt pull-ups before executing the FAH option and awards more points for pull-ups, thereby encouraging and rewarding female Marines for developing upper-body strength. The proposal also mitigates the possibility of unintended negative effects to recruiting, promotion, and retention by retaining the flexed-arm hang as a minimum standard since there could be a high possible failure rate if only pull-ups were tested. “Recognizing that many female Marines may not be able to do pull-ups initially, retaining the [flexed-arm hang] albeit in a devalued manner is a good introductory measure.”¹⁶² Initially, female PFT scores would likely decrease following implementation of the new policy, as did male PFT scores following the transition to “dead hang” pull-ups in 1997 (see figure 6). Unquestionably, women’s scores would gradually improve over time (as did the men’s scores), following incorporation of pull-ups and other strength training into exercise programs.¹⁶³

Indeed, just the *establishment* of the new requirement would encourage women to train harder since it would alter Marines’ expectations. The President’s Council on Physical Fitness and Sports reports, “Better perceptions of oneself and one’s abilities lead to enhanced effort, persistence, and achievement, which in turn further benefit self-perceptions.”¹⁶⁴ Further, *witnessing* female Marines perform pull-ups would also motivate other women to excel, since this would be the most powerful proof of women’s ability. According to most female Marines surveyed, seeing women perform pull-ups was the single most influential factor in motivating others to “take up” the pull-up challenge. Such inspiration and motivation, coupled with active training and encouragement from leaders, would support women’s decimation of the frailty

myth. Eventually, once PE classes in American schools provide appropriate emphasis for girls on the development of strength, the FAH can be eliminated altogether.

Tougher Standards, Stronger Women, Better Marine Corps

In addition to making women physically stronger, the transition to pull-ups would strengthen the Marine Corps' esprit de corps. Although female Marines performing an exercise on par with male Marines might seem trivial, the effects on unit cohesion would be profound. Since the Marine Corps began as an exclusively male organization, it is no surprise that there is considerable derision regarding (some) female Marines' inability to keep up in formation runs, carry their own packs on hikes, climb the rope on the obstacle course, or lift their own body weight over obstacles. Compounding the disparagement are the differing PFT standards used for male and female Marines. Not only are women being *conditioned* by the lower standards to fall behind in group physical training sessions, just the *existence* of different PFT evaluation criteria breeds resentment. Although the Marines surveyed or interviewed on the topic of PFT standards significantly differed in their opinions on women's physical capabilities, all Marines surveyed or interviewed agreed that different standards often lead to frustration. One male lance corporal stated that, "It's not right that a female can be weaker and not do any pull-ups and still get promoted faster than me just because she has a weaker [PFT] standard."¹⁶⁵ A male captain stated that even though he did not resent the lower standards for women, he knew many that did, "Male Marines see differing standards as women [being] allowed to be in [poorer] physical condition... and [some] female Marines resent the fact that they are looked at as different and in some way [inferior] to their male counterparts."¹⁶⁶

Although resentment caused by differing standards is not in itself a reason to transition to a pull-up requirement for women Marines, it remains that more challenging, gender-neutral

requirements would increase women Marines' confidence, foster mutual respect between the sexes, mitigate sexism (a feeling of superiority because of gender), and promote unit cohesion. The Marine Corps' manual for physical fitness stresses the importance of physical training to unit cohesion, stating that it should be used to "... provide a medium for developing the individual Marine's self-confidence and desire to excel, thereby enhancing the unit's overall discipline, morale, and esprit de corps."¹⁶⁷ A male captain who was surveyed agrees, contending that, "A Marine is a Marine. Having the same requirements and going through the same training builds unit cohesion. Marines want to be challenged. We are all Marines, and there is one Marine Corps, there should be one standard."¹⁶⁸ Since differing standards can lead to poor morale and unit cohesion, and since women can and will perform to a higher standard, it is therefore in the best interest of the USMC to adopt a pull-up requirement for female Marines. This would be an important step in the right direction towards a completely gender-neutral physical fitness standard. The Marine Corps, like America, is a stronger organization with stronger women.

Conclusion: The Exception to the Myth

An examination of history demonstrates that women's strength has prehistoric roots and that it has not always been undervalued or under recognized. Nineteenth century evolutionists, who maintained that the hierarchy of the sexes was irreversible due to an evolutionary environmental adaptation that was established millions of years ago, would be surprised to know that Pleistocene (2.5 million to 12,000 years ago) women were not "sequestered in caves, sweeping up stone dust and suckling their infants" as had always been inferred. On the contrary, anthropologic evidence indicates that societies of the Pleistocene era tended to be egalitarian, such as societies during times of war. Pleistocene women did not have the luxury of waiting for men to find food, and men did not have the ability to provide it without help. Sheer survival was

at stake. Research from the late 1990s indicates that Pleistocene women were strong and physically active, providing up to 70 percent of family nutrition. More importantly, they did not just forage and scavenge. Rather, women hunted, set snares, laid spring traps, sighted game, and participated in animal drives.¹⁶⁹ Women's strength was appreciated and exploited in later societies as well. With approval and encouragement from Spartan men, the girls and women of ancient Sparta threw the javelin and discus, ran foot races, performed gymnastics, wrestled, jumped, and danced. Even though Spartan society encouraged women's physical training mostly as a means to an end- strong women gave birth to healthy babies- Spartan women enjoyed more freedom than those of any other Greek city.¹⁷⁰ More importantly, the Spartans recognized exercise (and education) was beneficial to women's physical development and to society as a whole. Thus, at one point in history, female strength was appreciated (not just in times of crisis) and exercise was *known* to be beneficial to women's health. This lesson was lost, however, much like the lessons of unpopular wars.

After the decline of Sparta in the 4th Century BC, prevailing Greek views concerning women's capabilities and proper roles, such as those of the Athenians, replaced Spartan wisdom regarding the benefits of exercise and education for women. Since western culture is largely based on that of Ancient Greece, it is not surprising to learn that the Athenians sequestered women and pubescent girls indoors and gave no formal education beyond training for domestic duties.¹⁷¹ Additionally, the attempt of 19th century America to use science to "prove" woman's biological and irreversible inferiority to man may have been borrowed as well. The ancient Greek philosopher, Aristotle, who blamed Spartan women for the eventual demise of their city due to the social freedom and physical prowess they expressed, fully shared the "standard" Greek man's view of women's absolute inferiority to men. Like 19th century America, Aristotle

added a technical explanation to society's view, maintaining he could prove scientifically that women's bodies (and minds) were categorically, naturally, and unalterably inferior to men's.¹⁷² Essentially, Aristotle believed females were "deformed males," and applied this theory to all women.¹⁷³ Thus, as ancient as women's strength is the belief that women are permanently weak.

Fortunately, like lessons "relearned" in asymmetric conflicts, society has rediscovered that rigorous exercise is beneficial to women, and that women are capable of great strength. Sadly, not everyone is willing to abandon their "conventional" notions of women's capabilities. Even after women broke into the Olympics Games and proved that things unimaginable only a few years before were now matter of fact, the compelling prowess of women athletes still was not enough to decimate the traditional ideas of women's physical capabilities. Many believed the *average* woman was not up to the task of developing meaningful physical strength; the female Olympic athlete was the *exception* to the rule.¹⁷⁴ These women that had dared explore their physical potential inevitably discovered they were capable of great strength, but instead of dispelling the myths, these women were dismissed as being "oddities". Thus, even in the 21st century, lingering social issues and misunderstandings about presumed female limitations conspire to slow the development of women's athletic performance and opportunity.¹⁷⁵

Like society, remnants of the frailty myth persist in the USMC, as it has been slower to evolve than the society it is reflecting. As an example, even though most of America had been requiring school-aged girls to attend PE classes since the 1950s, the USMC did not add a physical fitness requirement to the PFT for women until 1969- fifty years after they became part of the Corps. Additionally, it was not until 1996 that the USMC increased the distance from 1.5 miles to 3 miles on the female PFT- twelve years after the marathon was added to the Olympics. Further, despite the USMC's conclusion in 2001 that the FAH was invalid, the FAH remains the

standard in 2012.¹⁷⁶ Before women Marines faced the certainty of combat, and when society misunderstood the physical capabilities of women, it was easier to accept the lack of physical rigor of the female PFT criteria. During the present day, however, the refusal to incorporate a pull-up requirement into the female PFT is baffling. Females are perfectly capable of performing strenuous activity, and there is no meaningful difference between the genders regarding strength, skill, and endurance in proportion to total body weight, lean body weight, and the same exposure to learning and practice.¹⁷⁷ Some say men's fear of losing their masculine identity will "motivate men to do everything they can to prevent women from appearing equally capable, physically."¹⁷⁸ Could this be the real reason for the reluctance to adopt pull-ups for women on the PFT? Rather than to protect women from unfair requirements, perhaps the reluctance to update the standards is to prevent women from encroaching into offensive ground combat arms specialties. Regardless of the reason, low standards and expectations mentally and physically compromise the individual Marine as well as the Corps, degrading the effectiveness of the entire organization.

Conversely, if women Marines were held to a higher standard, they would be better able to carry out their mission, assist a fellow Marine who might be wounded in combat, and defend themselves and those fighting to their left and right. Despite prevailing views that pull-ups are too challenging, increasing numbers of female Marines prove every day they are capable of upper body strength by mounting the bar and "cranking out" dead-hang pull-ups. Non-believers cling to their familiar, self-fulfilling notions, maintaining it is only the "exceptional" female Marine who can perform such a feat. She is exceptional, yes, but mostly in attitude, not necessarily in physical ability. She refused to acknowledge any limitations imposed by anyone other than herself and put forth the required effort to learn a new skill in the absence of a

requirement and in the presence of doubt. In the presence of a formal requirement, Marines will not only perform to the standards that are set for them, they will surpass them. Most importantly, the USMC will be a better fighting organization as a result. This may seem obvious to some, but that is only because women are facing physical equality for the first time.

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History of Marine Corps-wide Physical Testing

1775-1908	No evidence of Physical Readiness Test (PRT) policy	
1909-1917	Pres. Roosevelt Exec Ord	{ Line Officers - 50 mi walk / Staff Officers - 90 mi horseback ride Conducted over 3 consecutive days
1918-1955	Walk/Ride suspended due to WWI. No evidence of PRT policy during this period	
1956-1959	<u>Males</u> LtCol or below or <40 yrs	Chin ups, Pushups, Situps, 1 min squat thrusts, Broad jump, 50 yd Duck Waddle, 880 yd run for 30-40 yrs (no time limit), 440 yd run for <30 yrs (Sat-<75 sec) <u>Uniform</u> Shorts, shirt, athletic shoes
1960-1968	<u>Males</u> <40 yrs (regardless of rank)	Step Test, 20' Rope Climb, Fireman's Carry, Fire/Maneuver, 3M Forced March <u>Uniform</u> Boots/ Utes, Weapon, Light marching pack
1969-1971	<u>Males <46 yrs:</u> Tested on 5 of 9 events (1 from each group, no advance notice on test events) Grp I- Pullups, Pushups or 20' Rope Climb, Grp II-Situps or Leg Lifts, Grp III-Squat Thrusts, Grp IV-Broad Jump or Vertical Jump, Grp V-3M Run <u>Uniform:</u> Boots/Utes	<u>Females <35 yrs:</u> 120' shuttle run, Vertical Jump, Knee pushups, 600 yd run/walk, Situps <u>Uniform-Shorts, shirt, athletic shoes</u>
1972-1974	<u>Males <46 yrs:</u> Pullups, Situps, 3M Run	Females no change
1975-1996	<u>Males <46 yrs:</u> No change	<u>Females <46 yrs:</u> Flexed Arm Hang, Situps, 1.5M Run
1996	Males- "No Kip"	Females- 1.5M to 3M Run
1997	All Marines (regardless of age) take PFT, Situp to Crunch, Altitude waiver	
2007	MCMAP Tan Belt for all Marines	
2009	Combat Fitness Test introduced	

Figure 1

NCPFFDCV

PHYSICAL FITNESS TEST SCORING TABLE

Sex: F FEMALE							
Points	Flexed-Arm Hang	Crochet	1-Mile Run	Points	Flexed-Arm Hang	Crochet	3-Mile Run
100	70 sec	100	21:00	50	45 sec	50	29:30
99		99	21:10	49		49	29:36
98	69 sec	98	21:20	48	44 sec	48	29:40
97		97	21:30	47		47	29:50
96	68 sec	96	21:40	46	43 sec	46	30:00
95		95	21:50	45		45	30:10
94	67 sec	94	22:00	44	42 sec	44	30:20
93		93	22:10	43		43	30:30
92	66 sec	92	22:20	42	41 sec	42	30:40
91		91	22:30	41		41	30:50
90	65 sec	90	22:40	40	40 sec	40	31:00
89		89	22:50	39	39 sec	39	31:10
88	64 sec	88	23:00	38	38 sec	38	31:20
87		87	23:10	37	37 sec	37	31:30
86	63 sec	86	23:20	36	36 sec	36	31:40
85		85	23:30	35	35 sec	35	31:50
84	62 sec	84	23:40	34	34 sec	34	32:00
83		83	23:50	33	33 sec	33	32:10
82	61 sec	82	24:00	32	32 sec	32	32:20
81		81	24:10	31	31 sec	31	32:30
80	60 sec	80	24:20	30	30 sec	30	32:40
79		79	24:30	29	29 sec	29	32:50
78	59 sec	78	24:40	28	28 sec	28	33:00
77		77	24:50	27	27 sec	27	33:10
76	58 sec	76	25:00	26	26 sec	26	33:20
75		75	25:10	25	25 sec	25	33:30
74	57 sec	74	25:20	24	24 sec	24	33:40
73		73	25:30	23	23 sec	23	33:50
72	56 sec	72	25:40	22	22 sec	22	34:00
71		71	25:50	21	21 sec	21	34:10
70	55 sec	70	26:00	20	20 sec	20	34:20
69		69	26:10	19	19 sec	19	34:30
68	54 sec	68	26:20	18	18 sec	18	34:40
67		67	26:30	17	17 sec	17	34:50
66	53 sec	66	26:40	16	16 sec	16	35:00
65		65	26:50	15	15 sec	15	35:10
64	52 sec	64	27:00	14	x	x	35:20
63		63	27:10	13	x	x	35:30
62	51 sec	62	27:20	12	x	x	35:40
61		61	27:30	11	x	x	35:50
60	50 sec	60	27:40	10	x	x	36:00
59		59	27:50	9	x	x	x
58	49 sec	58	28:00	8	x	x	x
57		57	28:10	7	x	x	x
56	48 sec	56	28:20	6	x	x	x
55		55	28:30	5	x	x	x
54	47 sec	54	28:40	4	x	x	x
53		53	28:50	3	x	x	x
52	46 sec	52	29:00	2	x	x	x
51		51	29:10	1	x	x	x

*Round up all values (e.g., 21:01 to 21:09 equals 99 points)

Table 1

MCPTDCS

PHYSICAL FITNESS TEST SCORING TABLE

Rec H.	MALES			Points	Pushups	Curlups	1-Mile Run
100	20	100	18:00	50	10	50	26:20
99		99	18:10	49		49	26:30
98		98	18:20	48		48	26:40
97		97	18:30	47		47	26:50
96		96	18:40	46		46	27:00
95	19	95	18:50	45	x	45	27:10
94		94	19:00	44		44	27:20
93		93	19:10	43		43	27:30
92		92	19:20	42		42	27:40
91		91	19:30	41		41	27:50
90	18	90	19:40	40	8	40	28:00
89		89	19:50	39		39	28:10
88		88	20:00	38		38	28:20
87		87	20:10	37		37	28:30
86		86	20:20	36		36	28:40
85	17	85	20:30	35	7	35	28:50
84		84	20:40	34		34	29:00
83		83	20:50	33		33	29:10
82		82	21:00	32		32	29:20
81		81	21:10	31		31	29:30
80	16	80	21:20	30	6	30	29:40
79		79	21:30	29		29	29:50
78		78	21:40	28		28	30:00
77		77	21:50	27		27	30:10
76		76	22:00	26		26	30:20
75	15	75	22:10	25	5	25	30:30
74		74	22:20	24		24	30:40
73		73	22:30	23		23	30:50
72		72	22:40	22		22	31:00
71		71	22:50	21		21	31:10
70	14	70	23:00	20	4	20	31:20
69		69	23:10	19		19	31:30
68		68	23:20	18		18	31:40
67		67	23:30	17		17	31:50
66		66	23:40	16		16	32:00
65	13	65	23:50	15	3	15	32:10
64		64	24:00	14		14	32:20
63		63	24:10	13		13	32:30
62		62	24:20	12		12	32:40
61		61	24:30	11		11	32:50
60	12	60	24:40	10	2	10	33:00
59		59	24:50	9		9	33:10
58		58	25:00	8		8	33:20
57		57	25:10	7		7	33:30
56		56	25:20	6		6	33:40
55	11	55	25:30	5	1	5	33:50
54		54	25:40	4		4	34:00
53		53	25:50	3		3	34:10
52		52	26:00	2		2	34:20
51		51	26:10	1		1	34:30

* Round up all values (e.g., 18:01 to 18:09 equals 99 points)

Flexed Arm Hang (FAH) Example



Figure 2

Gender Conditioning at the YMCA

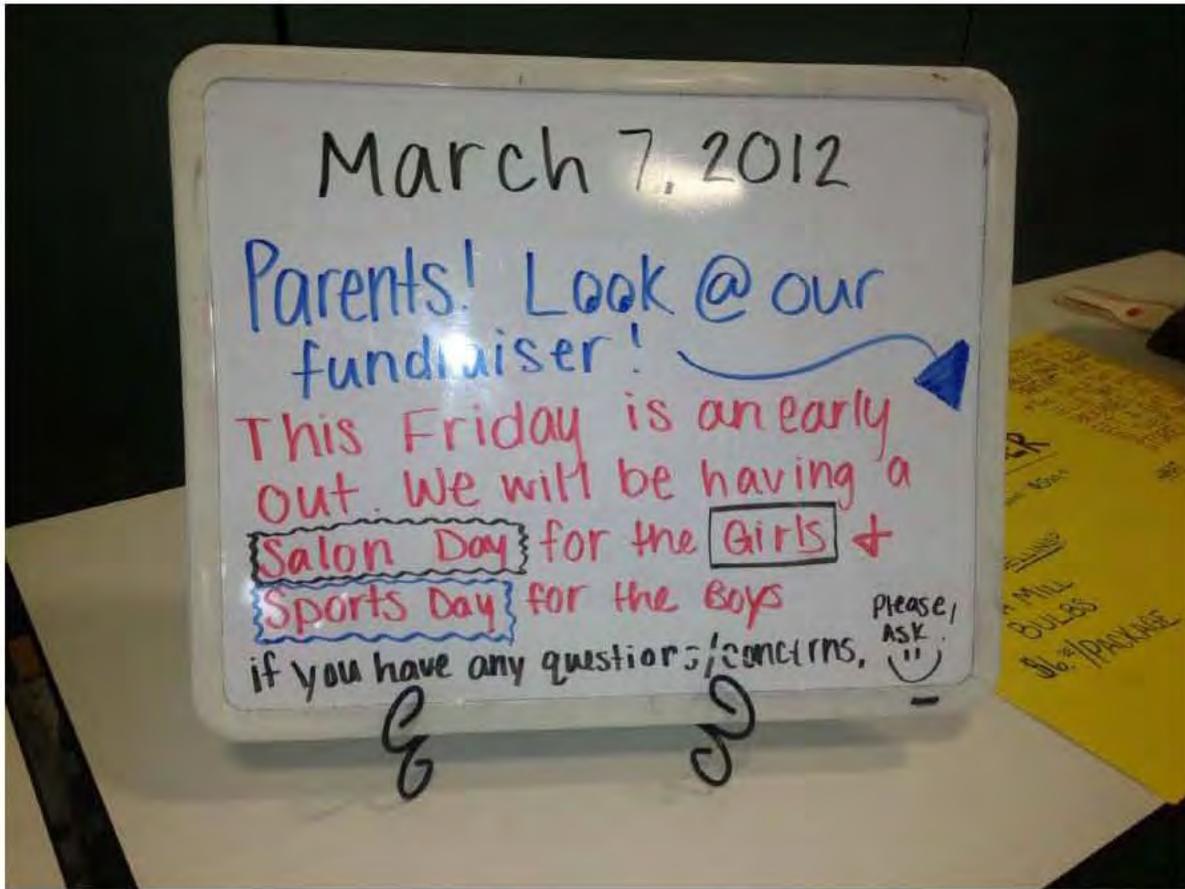


Figure 3



PFT Scoring Table of Study Sample



	Study Sample	CY-11 Data
PFT	AVG	AVG
17 – 26	249	258
27 – 39	262	263
40 – 45	247	253
ALL	254	256
FAH Time	AVG	AVG
17 – 26	63	63
27 – 39	66	65
40 – 45	61	64
ALL	64	63

Table 2



Dead-hang Pull-up Distribution of Study Sample

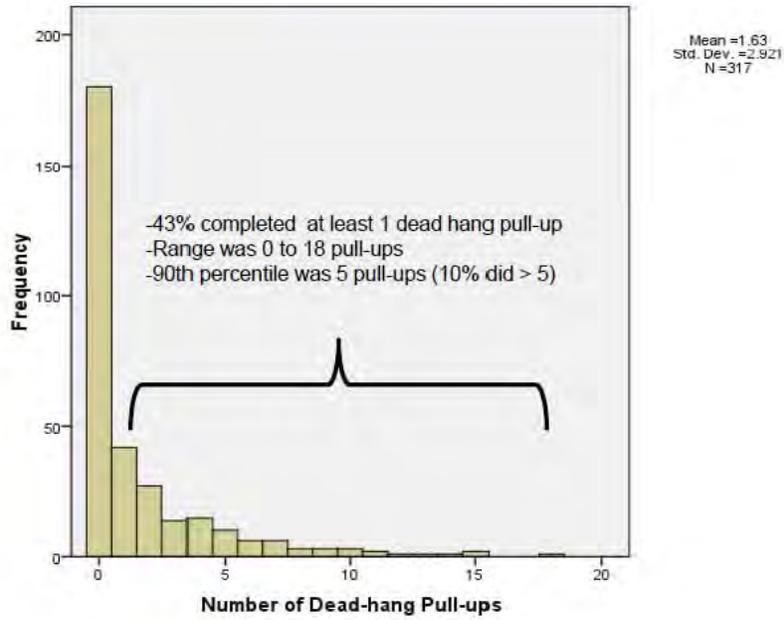


Figure 4

50

Pavel's Ladder

"Of all the exercises, the one with the largest mind game attached to it is the PULLUP. One thing I have learned is that women AND men CANNOT do pull-ups IF they do not PRACTICE pull-ups. On the flip side, the common denominator among those men AND women who can do dead-hang pull-ups, are those who practice pull-ups."

Stew Smith, strength and conditioning specialist

The pull-up is often considered to be one of the best upper-body exercises for building functional strength and fitness, but for some people the move is difficult to perform since it is an intermediate-level, compound exercise that uses several large muscles of the upper body. As such, for many people, learning to perform even just one pull-up requires conditioning and practice, which is not necessarily the case with most other exercises (the push-up, for example). Thus, pull-ups have taken on a mystique all their own.

Contrary to popular belief, anyone can learn to perform pull-ups and there is not a proprietary limit on how many pull-ups a person can achieve. Most people simply do not know how to train. The hardest pull-up to learn is the first; to get to twenty is merely to practice. Finally, although anybody can learn to do pull-ups, carrying excess body greatly increases the level of difficulty. Thus, if a person is overweight, diet and cardiovascular fitness are as crucial as strength training.

The Science of Pavel's Ladder

Specificity + Frequent Practice = Success. According to Pavel Tsatsouline, a former Soviet Special Forces physical training instructor, "If you want to get good at pull ups, why not try to do a lot of pull-ups?"

Physical trainers have learned the best method to get better at a specific exercise is to perform it often. By doing frequent, non-exhaustive sets of an exercise, muscles gradually get more efficient at the movement. During the process of becoming more efficient, it becomes easier for a person's muscles to repeat that movement. Hence, one does not have to develop overly large, bulky muscles in order to get better at doing pull-ups. Rather, by doing a lot of pull-ups, one becomes more proficient at doing them. The theory is called "synaptic facilitation" and delivers more volume in less time since repetitive and reasonably intense stimulation strengthens the nerve impulse to the muscles involved, making them stronger and more enduring.

The best technique to perform non-exhaustive sets of pull-ups is to perform multiple sets spread out over the course of a day, 4 to 6 days a week. In doing so, a person can perform hundreds of pull-ups a week without triggering delayed onset muscle soreness (DOMS), which is residual pain and stiffness in the muscles and surrounding tissue that occurs the day or two following exercise. Preventing DOMS allows a person to perform the same number of pull-ups (or more) the day after a pull-up workout, thereby ensuring volume is maximized.

The Workout

One technique to perform multiple sets of pull-ups without overly fatiguing the neuromuscular system is the "ladder" technique, using the "I go, you go" approach. This method is used by the Soviet Special Forces to meet the Spetsnaz requirement of 18 dead hang pull-ups wearing a 22 pound bullet-proof vest.

It goes like this: I do one pull-up and drop off the pull-up bar. Then you do one and drop off the pull-up bar. I do two, then you do two, I do three, then you do three, etc. Once you reach the top "rung" of your ladder, you take a short break (a couple minutes or so) and start again at the bottom rung of your ladder with one repetition, vice climbing back down the ladder (which would be a pyramid). If you train alone, you can simply time the pauses between each rung by estimating how long it would take a partner to match your repetitions (about 5 to 15 seconds between each rung of the ladder).

For example, if the top of your ladder is six, and you were doing two sets of ladders, it would look like this: 1, 2, 3, 4, 5, 6 then 1, 2, 3, 4, 5, 6. Using this technique, one can do over a hundred pull-ups daily without burning out.

The top rung of each ladder should be terminated well short of failure, because pushing to exhaustion will burn out the neuromuscular system and force a person to cut back on volume during subsequent pull-up workouts. As such, make sure to stop at a preset number that suits your capacity (which would be the top rung of your ladder), not that of your partner. In other words, if your maximum number of pull-ups is currently 12 to 15, it is best to set 4 or 5 repetitions as your top rung so you can continue to execute several sets of ladders without burning out. Essentially, you'll want to perform 50% to 80% of your maximum number of reps so that your muscles avoid failure. The goal is to perform as many sets as possible without struggling.

You can do pull-ups any time of the day, as often as is practical, but one technique that works for Marines is to perform pull-ups three times per day: morning (before work), noon (lunch), and afternoon (after work). During each session, aim to perform 2 to 4 ladders (or more). A person who can currently execute 12 to 18 maximum pull-ups should aim to do perform between 60 to 150 pull ups in a day, 4 to 6 days a week.

If your maximum set of pull-ups consists of only 1 to 3 repetitions, you can still use the ladder technique (your top rung might only be one or two pull-ups) and you should aim to perform 6 to 15 pull-ups total in a day, vice 60 to 150.

If you are pressed for time, you can also do all your sets of ladders in one session. In this case, you might push yourself closer to the "top" of your limit for each ladder vice stopping several pull-ups short of your limit before starting again at one repetition. Remember, the idea is to do as many pull-ups as you can in a day without being sore the next day.

Do as much quality work as possible while being as fresh as possible. So, do not over-train and make sure you refrain from any "kipping" or "jerking" during your ladder work-out, and come all the way down and all the way up. This should not be too hard since the reps are relatively low. Forcing yourself to focus on good form will help to ensure you are not sore the next day and will make pull-ups during the PFT seem easy by comparison.

Also, if the pull-ups start to become difficult as you approach the top rung you normally use during your ladders, stop and start again with one repetition (with a short rest in between), ensuring to use this new number as your "top rung" throughout the rest of your workout. Or,

take a break and come back to the pull-up bar a couple hours later and start your ladder workout again using your normal top rung.

Try to gradually build both volume and intensity. As you get stronger and more efficient at pull-ups, increase the top rung of your ladder in order to do more pull-ups during the day in less time.

Variations

Add weight. You do not have to add a lot of weight to be effective and you may have to decrease your top rung on the ladder. This is OK as long as you keep performing ladders and keep performing large quantities of pull-ups. Doing pull-ups in boots and utilities is one method to add weight. Wearing boots and utilities also makes it easy to perform several sets of ladders throughout the day without disrupting your work-day routine. Finally, when performing pull-ups during the PFT in green PT gear, the difference in weight is striking, making it easier to execute more pull-ups using less energy.

Add one negative. Emphasizing the negative stimulates “synaptic potentiating”. Doing a slow negative on the final pull-up produces a very intense contraction, but be careful not to perform too many negatives, which have a tendency to overly fatigue muscles.

Do "L" pull-ups. You can look these up on a cross-fit web-site. Form an "L" with your legs and your body while hanging on the pull-up bar. Your legs should be at a 90 degree angle with your torso, parallel to the deck, and your legs should be straight (no bend in the knee). Keep the "L" formation with your legs and body as you pull up as well as when you lower yourself. Do this during your normal ladder routine of pull-ups. You may have to decrease your top rung.

Starting From Zero: The First Pull-up

If you cannot perform any pull-ups, in addition to conducting auxiliary exercises that work the pull-up muscles (back, bicep, lats, shoulders, etc), train as much as possible on a pull-up bar. Perform negatives and “half” pull-ups. Pull yourself half way up (or as far as you can go) and then lower yourself, and repeat. Also, get your chin above the bar and lower yourself half way down and then pull back up until your chin is above the bar again, and repeat. You should also get someone to spot you in the performance of full-range pull-ups as well. This person should wait to spot you until you pull up as far as you can on your own. Eventually, you will not need any assistance to perform a complete pull-up on your own. Once you can complete one pull-up, you can start using the ladder technique.

You may also use a chair, rubber bands, or a pull-up machine (weigh assisted) to learn to do a pull-up, but be careful to avoid becoming reliant on the assistance. You may only get good at “assisted” pull-ups vice learning how to do a “dead hang” pull-up.

Speed in NY Marathon by gender, 1997

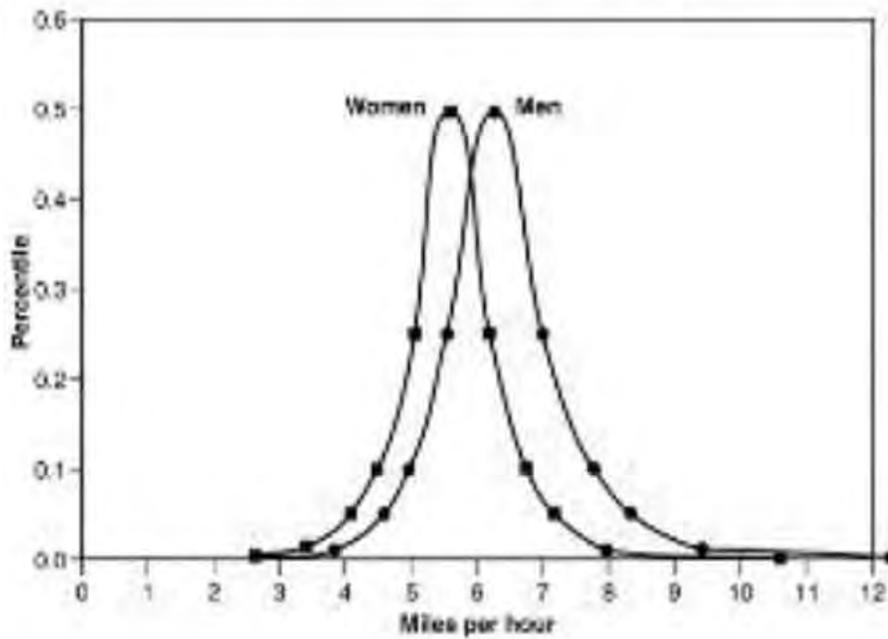


Figure 5

Recommended Upper-Body Strength Test Scoring Table

FEMALE UPPER BODY STRENGTH		MALE PULLUPS	
REPS/SECONDS	POINTS	REPS	POINTS
5	100	20	100
4	95	19	95
3	90	18	90
2	85	17	85
1	80	16	80
70	75	15	75
69	74	14	70
68	73	13	65
67	72	12	60
66	71	11	55
65	70	10	50
64	69	9	45
63	68	8	40
62	67	7	35
61	66	6	30
60	65	5	25
59 to 33 seconds = 64 to 38 pts		4	20
32 to 15 seconds = 36 to 15 pts		3	15
16	16	15 PTS IS MINIMUM FOR BOTH MALE AND FEMALE TESTS	
15	15		

PULLUPS

1.63
PULLUPS
WAS
AVERAGE
IN DATA
SET

15
PULLUPS
WAS
MARINE
CORPS
WIDE
AVERAGE
IN CY-10

FAH

Table 3

Male Composite PFT Score from 1986 to 2010

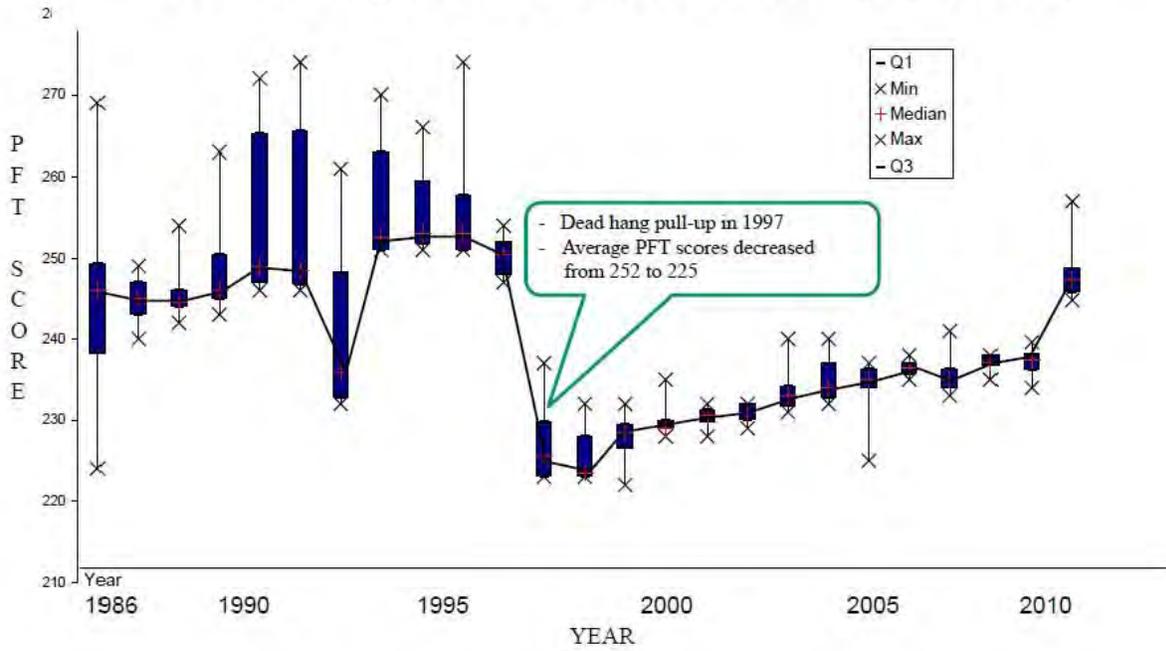


Figure 6

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-Data reflects total PFT score
 -By-event data entry not requirement until 2009

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